



Centre for Land and Water

Winter Lectures 2010

Six informative lunchtime lectures in the
Green Shed: Fridays at 12 noon

Lecture 1

The Virtual Climate Station Network

Andrew Tait



Winter Lectures 2010

REGISTRATIONS REQUIRED

Phone: 06 650-4532 or Email greenshed@claw.net.nz

Small charge to cover expenses: \$25 inc GST per lecture
(\$100 inc GST for a Series Registration*)

You will receive a light lunch (if you register on time), a lecture and an invitation to stay and discuss the topic in more depth should you wish.

ACKNOWLEDGEMENTS:

The Centre for Land and Water thanks the Winter Lecturers who have generously given their time:



PAGEBLOOMER



NOTES:

- * We may cancel or vary presentations if speakers become unavailable or if registrations fail to meet minimum numbers.
- * If a speaker becomes unavailable, we may arrange a suitable replacement to cover the same or a similar topic.
- * Holders of a Series registration will be refunded for any cancelled lectures at \$20 inc GST per cancellation, up to \$100 inc GST total.

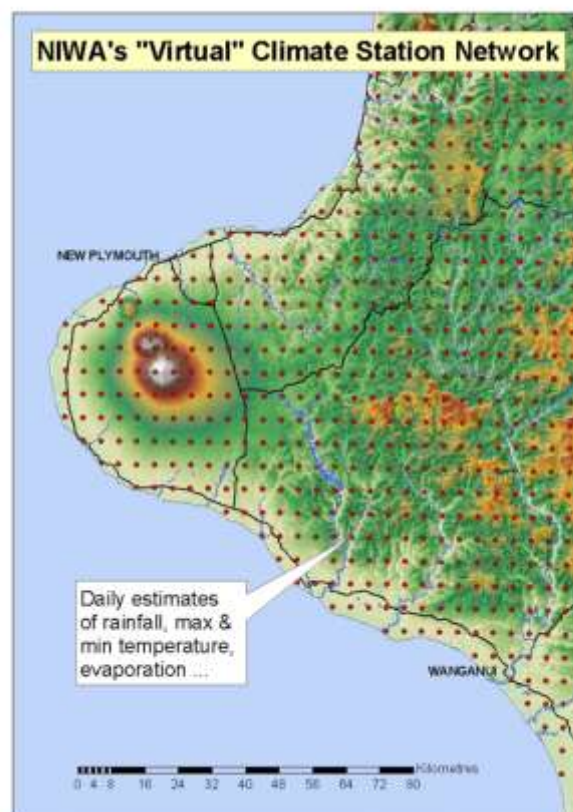
NIWA's virtual climate station network

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What is it?

- Interpolated daily values of 11 climate variables
- 0.05° lat/long grid (approx 5km)
- Sophisticated interpolation methodology (ANUspline)
- Errors larger in complex terrain and areas with low density observations
- Automatically updated every day
- Back-dated to 1960 (rain), 1972 (most other variables), 1997 (wind)
- Basis for many products, including 15-day forecasts, seasonal outlooks and climate change projections



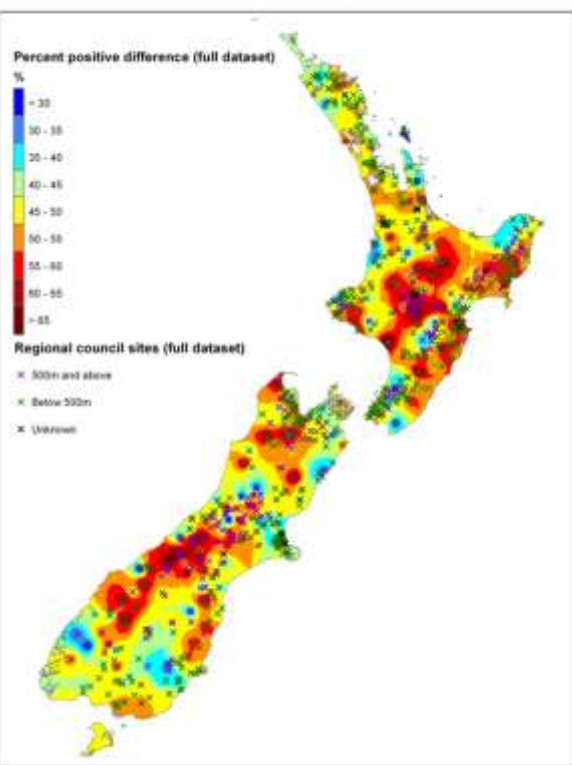
How can I get it?

- Available via <http://cliflo.niwa.co.nz>
- Choose "Special datasets"
- Search by lat/long
- Extracts all variables for specified period
- Good for getting data from a few sites at a time
- For multiple site data access, we can set up an ftp transfer or curl script

Station identifier	A	B	C	D	E	F	G	H	I	J	K	L	M
1 Station identifier													
2 Name	Agent Number	Network ID	Latitude (°S)	Longitude (°E)	Height (m)	Time Zone	Observer	Observing Authority					
3 Readings (ET02	P24142	38.629	176.175	0	D	18aa						
4 Note	If station precision types are "W" = based on whole values, "F" = estimated to both decimals												
5 0 = derived from gauge, "E" = error codes derived from gauge													
6 * = based on GPS readings (ACCURATE), "D" = by definition i.e. grid points													
7 Notes on interpreting Virtual Climate Station Data													
8 1 MSLPress = Mean sea level pressure at time local day (hPa)													
9 2 PET = 24-hour Penman potential evapotranspiration total from time local day (mm)													
10 3 Rain = 24-hour rainfall total from time local day (mm)													
11 4 RH = Relative humidity at time local day (%)													
12 5 Sulfur = 24-hour soil moisture index total from time local day (mm, positive = surf, negative = soil moisture deficit)													
13 6 Temp[soil]2cm = Earth temperature at 2cm depth at time local day (degC)													
14 7 Rain = 24-hour gaged water radiation total from time local day (mm/d)													
15 8 Tmax = Maximum temperature over 24 hours from time local day (degC)													
16 9 Tmin = Minimum temperature over 24 hours from time local day (degC)													
17 10 VapPress = Vapour pressure at time local day (hPa)													
18 11 WindSpeed = Average wind speed at 10m above ground over 24 hours from time local day (m/s)													
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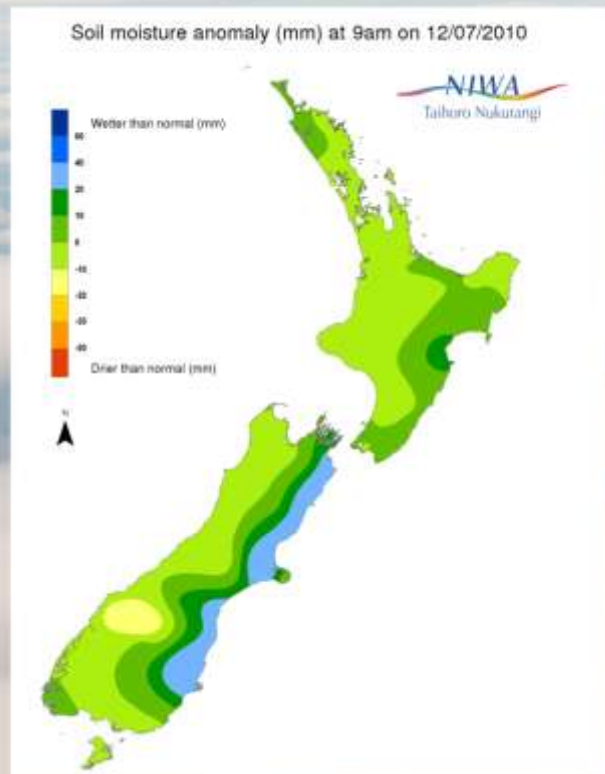
How good is it?

- Daily Temperature = ± 1.2 to 1.6°C , Tmax better than Tmin [RMSE]
- Daily PET = $\pm 25\%$ during Sep-Apr, higher in winter [RMSE]
- Daily Solar Radiation = ± 20 to 30% [RMSE]
- Daily Rainfall = ± 40 to 60% , higher in mountains [MAE]
- Monthly Rainfall = ± 20 to 40%
- Annual Rainfall = ± 10 to 20%
- Bias is slightly negative, averaged over all regional council sites, but varies geographically



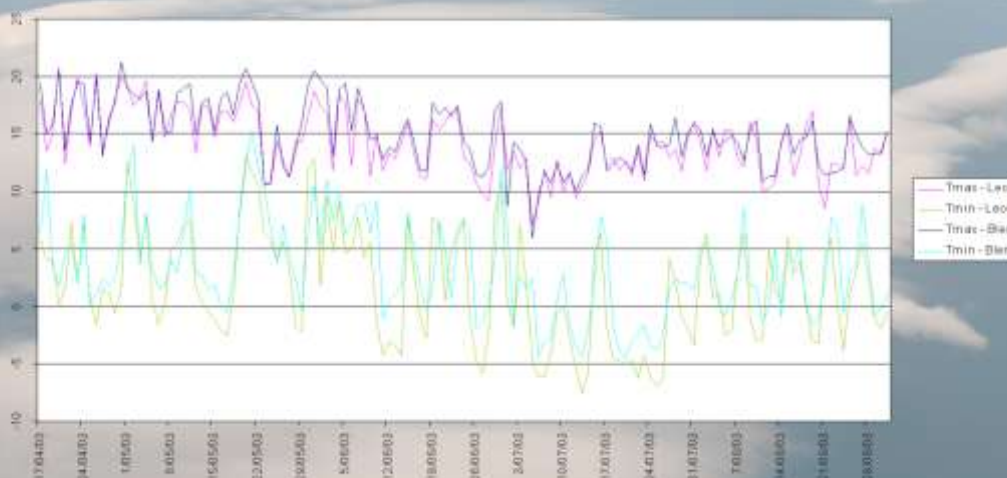
Applications

- Long-term average climate maps
- Climate change projections (statistical downscaling and validation)
- 15-day forecasts
- Up-to-date climate maps and plots
- Water allocation
- Pasture and forest production modelling
- Drought indices, based on water balance estimates
- Groundwater modelling
- Snow modelling
- Pest habitat modelling
- Crop suitability maps
- Streamflow modelling



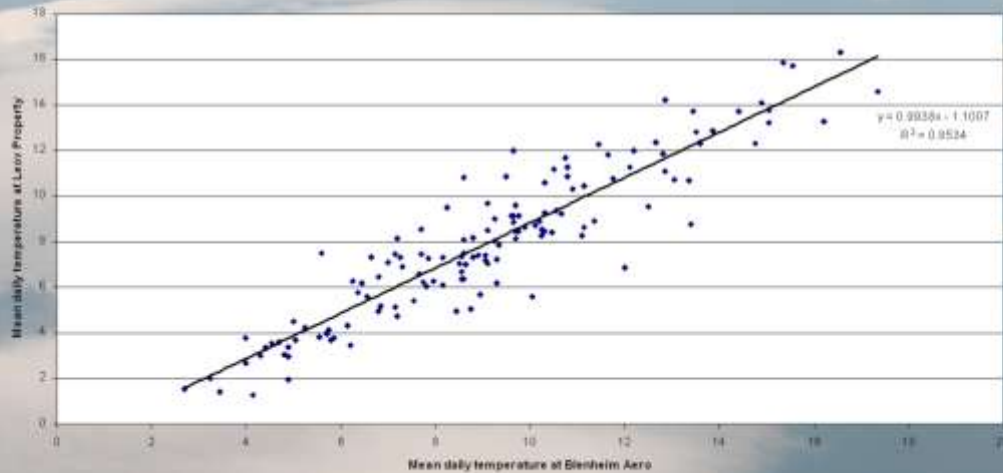
An example application: extending short-term records

Daily Max and Min Temperature Comparison



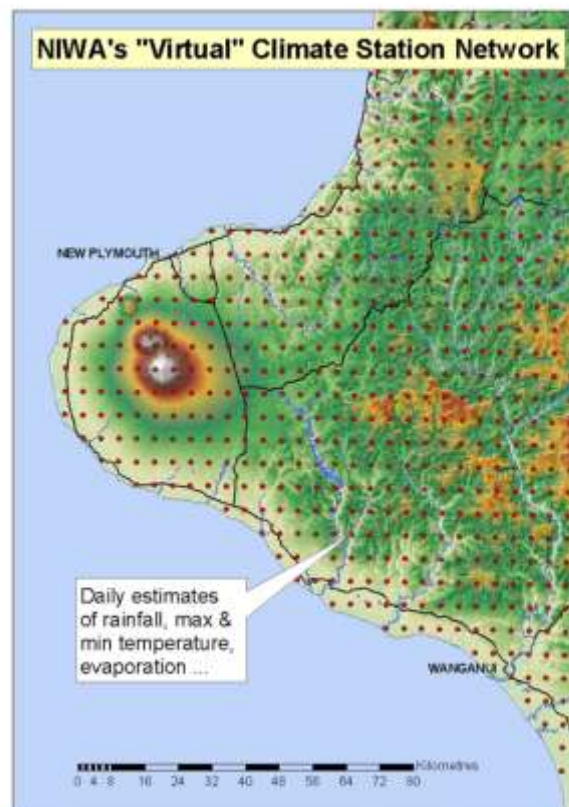
An example application: extending short-term records

Mean Temperature Regression Analysis



Summary

- Interpolated daily values of 11 climate variables
- Available via cliflo (for free)
- Best estimates at locations without observations
- Errors larger in complex terrain and areas with low density observations
- Basis for many products, including 15-day forecasts, up-to-date climate maps and climate change projections
- Being used by many users for operational and research applications





Centre for Land and Water

WELCOME

Welcome to the Centre for Land and Water, a venue supporting sustainable agriculture through training, research and consultancy.

The Centre provides professional offices, meeting and seminar facilities and land for research and training.

We currently have rental offices available. Terms by agreement - phone, fax, copy and print facilities available on-site.

The Green Shed seminar venue is available for training, meetings or for general event hire. Contact us: Phone: 06 650-4532 or Email greenshed@claw.net.nz

The Centre is located on a 4 ha site with easy access and plentiful parking. Entry is from Ruahapia Road, accessed from Karamu Road (SH2) at Waipatu or Pakowhai Road at Chesterhope. It is 4 km (8 minutes) from the Hastings CBD, 17 km (20 minutes) from Napier CBD and 18 km (20 minutes) from Hawke's Bay Airport.

COMING SOON

CLAW Short Seminars:

Communications: Preparing a media release

Communications: Writing popular articles

Communications: Writing technical reports and manuals

Communications: Preparing and delivering public presentations

Irrigation: System calibration theory and practice

Irrigation: How much water do I really need?

CLAW Short Courses

NZQA Certified Irrigation Evaluator

The Micro Cropping Farm for Research and Technology Transfer

Contact us to become involved in this exciting new initiative



Centre for Land and Water

WINTER LECTURES 2010

1. NIWA Virtual Climate Station Network: Friday 16 July

Speaker: Andrew Tait, NIWA

The Virtual Climate Station Network provides daily climate estimates at 5km intervals across N.Z. Andrew will explain how the data is estimated, and how the network can be accessed.

2. Nitrogen Testing and Sample Preservation: Friday 23 July

Speaker: Peter Lorentz, Analytical Research Laboratories

Peter will explain the different soil nitrogen tests, outline correct soil nitrogen sampling methods, and describe the steps needed to make sure the samples you take in the field get to the lab in good condition for analysis.

3. Soil pH - Crop Response & Soil Mapping Options: Friday 30 July

Speaker: Stephen Trolove, Plant and Food Research

Stephen will discuss crop responses to pH, including critical pH ranges for key Hawke's Bay crops, and will describe a process for farmers to determine whether the expense of a detailed soil pH survey may be warranted.

4. Vehicle Tracking and Fleet Management: Friday 6 August

Speaker: John Brew, Astrata

Astrata designs systems combining GPS, wireless communications and GIS to monitor machinery or other assets. John will talk about applications for agriculture, asset management, fleet & personnel tracking and health & safety.

5. Fuel Use Mapping and Bio-Fuel update: Friday 13 August

Speakers: Dan Bloomer, LandWISE and Tomo Reed, EECA

Dan will explain how to capture engine data and create maps of fuel consumption by tractors and present 'proof of concept' results from fuel mapping. Tomo will up-date us on bio-fuels and how to make bio-fuel available in Hawke's Bay.

6. Surfactants; types, actions and combinations: Friday 20 August

Speakers: Gordon Harris, Zelan, and David Manktelow, AR&T

Gordon and David will outline the types of surfactants available, how they work, and will give guidance for growers contemplating multiple product mixes as part of their spray programme.